035 Video Correction for Pinnacle Studio MP10

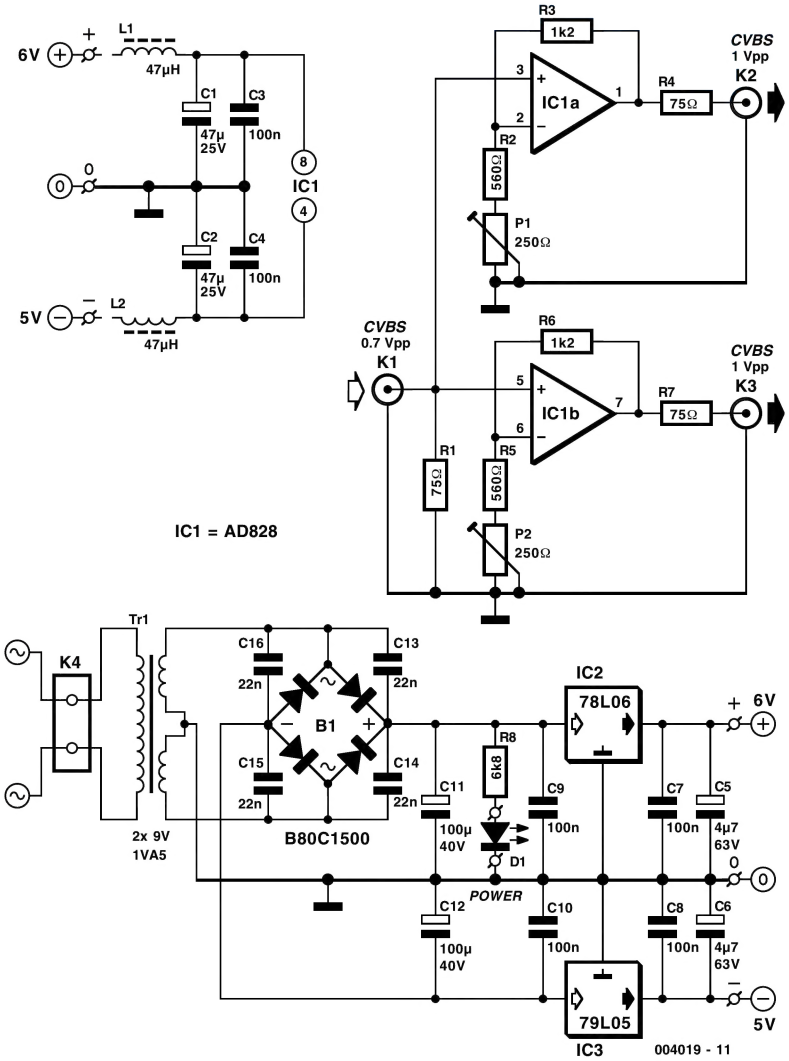
T. Giesberts

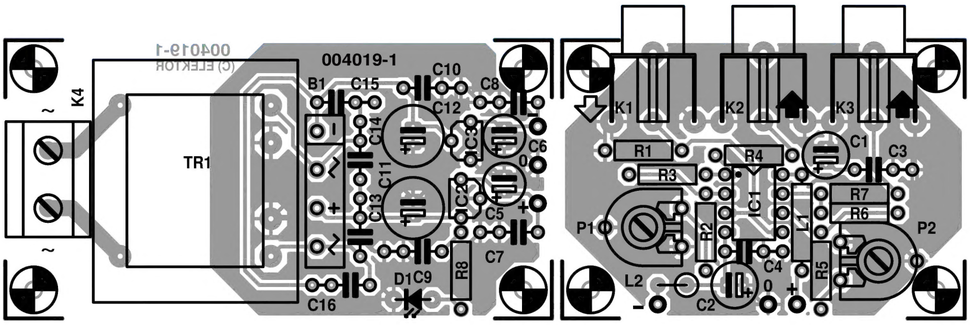
The Pinnacle Studio MP10 is an external real-time MPEG1 codec that includes composite video input and output. The output provides only 0.7 V, which is too low for most video equipment. Many video inputs are standardised for 1-V signals. The low output level of the MP10 can easily be corrected. The correction circuit, with its own small power supply, can also be used for many other applications.

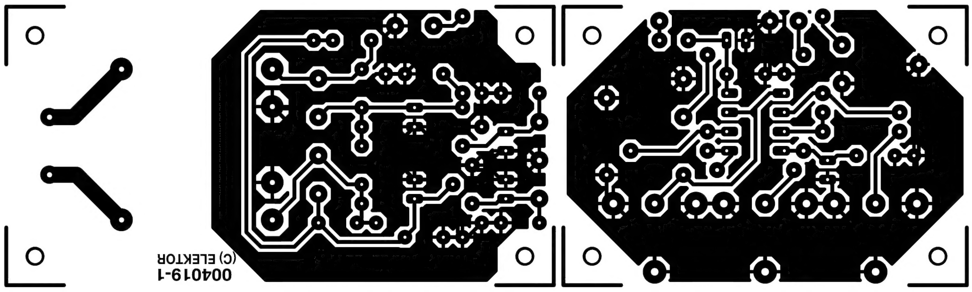
An Analog Devices AD828 dual low-power video opamp is used for the amplifier. Both opamps are connected to the output of the MP10, so two separate devices can be connected to the outputs of the correction circuit. The amplifier IC combines high bandwidth and a large slew rate with a relatively low no-load current consumption. The input and outputs of the circuit have the standard 75 Ω impedance. This means that the gain of the amplifiers must be a bit less than 3 (2 ÷ 0.7 = 2.86). Two trimpots (P1 and P2) allow the output levels to be set to the standard value, and compensate for various component tolerances. The inputs and outputs are DC-coupled, since certain video inputs need a signal with a DC offset to maintain the proper black level. With VHF/UHF modulators or video capture cards for PCs, the synchronisation may otherwise be unstable with bright pictures, since the sync pulses are weakened by the asymmetric supply voltage and the equipment in question evidently does not have clamp circuitry. According to the data sheet, the no-load bandwidth of the IC is 85 MHz at a gain of 2 with a ± 5 V supply. With a 75-Ω load (150 Ω in total), the measured bandwidth is roughly 45 MHz (1 V_{pp} across 75 Ω). The supply voltages for the IC are well decoupled by L1, L2, and C1 through C4.

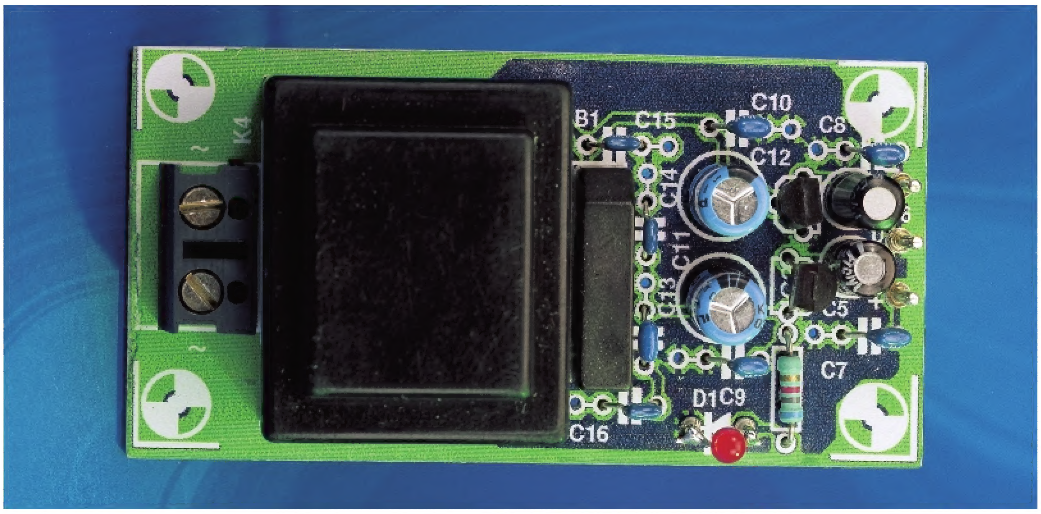
To minimise power dissipation, the supply voltages are limited to +6 V and –5 V. The positive voltage is larger, since we assume that the signal is usually positive and that consequently more headroom is needed on the positive side. The power supply is a standard design, with generous RF decoupling. The 78L06 and 79L05 voltage regulators can adequately handle the low current demand. LED D1 is the required mains power indicator, which must be externally visible when the circuit is built into an enclosure.

The printed circuit board layout uses standard components and has been made as compact as possible. IC1 was mounted in a standard IC









COMPONENTS LIST

Resistors:
R1,R4,R7 = 75Ω
R2,R5 = 560Ω
R3,R6 = 1kΩ2
R8 = 6kΩ8
P1,P2 = 250Ω preset

Capacitors:
C1,C2 = 47µF 25V radial
C3,C4,C7-C10 = 100nF ceramic
C5,C6 = 4µF7 63V radial
C11,C12 = 100µF 40V radial
C13-C16 = 22nF ceramic

Inductors:
L1,L2 = 47µH

Semiconductors:
D1 = high-efficiency LED
B1 = B80C1500 (80V piv, 1.5A peak) rectangular case
IC1 = AD828AN (Analog Devices) (Farnell)
IC2 = 78L06
IC3 = 79L05

Miscellaneous:
K1,K2,K3 = cinch sockets, PCB mount (e.g., Monacor/Monarch type T-709G)
K4 = 2-way PCB terminal block, raster 7.5 mm
Tr1 = mains transformer, PCB mount, secondary 2x9 V/1.5 VA (e.g. Monacor/Monarch type VTR-1209)

socket for the measurements, but it would be better to solder it directly to the board. The layout of the power supply and amplifier portion has been keep modest, so that you should not have any trouble finding a small enclosure to hold everything.

The no-load current of the IC is around 13 mA with no input signal. With both outputs loaded and driven, the current rises to around 16 mA.

The PCB shown here is unfortunately not available ready-made through the Publishers' Readers Services.

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